

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference OPP030280KR	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/KR 2003/000883	International filing date (day/month/year) 2 May 2003 (02.05.2003)	(Earliest) Priority Date (day/month/year) 8 August 2002 (08.08.2002)	
Applicant SK CHEMICALS CO., LTD			

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report
  - a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
  - b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:
  contained in the international application in written form.
  filed together with the international application in computer readable form.
  furnished subsequently to this Authority in written form.
  furnished subsequently to this Authority in computer readable form.
  the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
2.  Certain claims were found unsearchable (See Box I).
3.  Unity of invention is lacking (See Box II).
4. With regard to the title,
  - the text is approved as submitted by the applicant.
  - the text has been established by this Authority to read as follows:
5. With regard to the abstract,
  - the text is approved as submitted by the applicant.
  - the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is Figure No.: 1
  - as suggested by the applicant.
  - because the applicant failed to suggest a figure.
  - because this figure better characterizes the invention.
  - None of the figures.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR 03/00883-0

## CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: C07C 63/38, C07C 51/265

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: C07C 63/38, C07C 51/265

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

STN:CAS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 1999/018059 A1 (Eastman Chemical Company) 15 April 1999 (15.04.1999) <i>claims, page 3, line 28 - page 6, line 26</i>	1-6
P,X	WO 2003/022791 A1 (Lonza Spa) 20 March 2003 (20.03.2003) <i>claims, example.</i>	1-3,4,5,7
Y	US 5183933 A1 (Jon J. Harper et al.) 2 February 1993 (02.02.1993) <i>claims, examples, table III.</i>	1-6
Y	US 4950786 A1 (Paul A. Sanchez et al.) 21 August 1990 (21.08.1990) <i>claims, examples</i>	1-3,5
Y	JP 06 279356 A2 (Mitsubishi Petrochemical Co. Ltd) 4 October 1994 (04.10.1994) (abstract) retrieved on 12.3.2004 retrieved from STN CAS Database	1,2,7

 Further documents are listed in the continuation of Box C. See patent family annex.

- \* Special categories of cited documents:
- „A“ document defining the general state of the art which is not considered to be of particular relevance
  - „E“ earlier application or patent but published on or after the international filing date
  - „L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  - „O“ document referring to an oral disclosure, use, exhibition or other means
  - „P“ document published prior to the international filing date but later than the priority date claimed
- „T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- „X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- „Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- „&“ document member of the same patent family

Date of the actual completion of the international search  12 March 2004 (12.03.2004)	Date of mailing of the international search report  5 May 2004 (05.05.2004)
Name and mailing address of the ISA/AT  Austrian Patent Office Dresdner Straße 87, A-1200 Vienna Facsimile No. 1/53424/535	Authorized officer  HOFBAUER P.  Telephone No. 1/53424/225

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 03/00883-0

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
JP A 6279356A 2			none		
US A 4950786		1990-08-21	CA C 1326860		1994-02-08
			KR B 137665		1998-04-30
			MX B 169910		1993-07-30
			EP A 0329273		1989-08-23
			DE T 68925222T		1996-05-15
US A 5183933		1993-02-02	SG A 94682		2003-03-18
			JP B 3390169B2		2003-03-24
			DE T 69230967T		2000-12-14
			ES T 2145749T		2000-07-16
			DE D 69230967D		2000-05-31
WO A 19990180 59			none		
WO A 20030227 91			none		

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

YOU ME PATENT & LAW FIRM  
Teheran Bldg., 825-33,  
Yoksam-dong, Kangnam-ku,  
135-080 Seoul  
Republic of Korea



**PCT**

**WRITTEN OPINION**

(PCT Rule 66)

		Date of mailing (day/month/year) 5 May 2004 (05.05.2004)
Applicant's or agent's file reference  OPP030280KR	REPLY DUE  within 2 months/days from the above date of mailing	
International application No.  PCT/KR 2003/000883	International filing date (day/month/year)  2 May 2003 (02.05.2003)	Priority date (day/month/year)  8 August 2002 (08.08.2002)
International Patent Classification (IPC) or both national classification and IPC IPC <sup>7</sup> : C07C 63/38, C07C 51/265		
Applicant SK CHEMICALS CO., LTD		

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
- I.  Basis of the opinion
  - II.  Priority
  - III.  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV.  Lack of unity of invention
  - V.  Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI.  Certain documents cited
  - VII.  Certain defects in the international application
  - VIII.  Certain observations on the international application
3. The applicant is hereby invited to reply to this opinion.
- When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).
- How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3.  
For the form and the language of the amendments, see Rules 66.8 and 66.9.
- Also For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4bis.  
For an informal communication with the examiner, see Rule 66.6.
- If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 08.12.2004.

Name and mailing address of the IPEA/AT  
Austrian Patent Office  
Dresdner Straße 87, A-1200 Vienna

Authorized officer

HOFBAUER P.

Facsimile No. 1/53424/200

Telephone No. 1/53424/225

Form PCT/IPEA/408 (cover sheet) (July 1998)

**WRITTEN OPINION**International application No.  
PCT/KR 03/00883-0**I. Basis of the opinion****1. With regard to the elements of the international application:\*** the international application as originally filed the description:

pages , as originally filed  
pages , filed with the demand  
pages , filed with the letter of

 the claims:

pages , as originally filed  
pages , as amended (together with any statement) under Article 19  
pages , filed with the demand  
pages , filed with the letter of

 the drawings:

pages , as originally filed  
pages , filed with the demand  
pages , filed with the letter of

 the sequence listing part of the description:

pages , as originally filed  
pages , filed with the demand  
pages , filed with the letter of

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

 the language of a translation furnished for the purposes of international search (under Rule 23.1(b)). the language of publication of the international application (under Rule 48.3(b)). the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:** contained in the international application in printed form. filed together with the international application in computer readable form. furnished subsequently to this Authority in written form. furnished subsequently to this Authority in computer readable form. The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished. The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.**4.  The amendments have resulted in the cancellation of:** the description, pages the claims, Nos. the drawings, sheets/fig**5.  This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as „originally filed“.

## WRITTEN OPINION

<p>International application No. PCT/KR 03/00883-0</p>
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<b>V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</b>		
1. Statement		
Novelty (N)	Claims 7	YES
	Claims 1-6	NO
Inventive step (IS)	Claims —	YES
	Claims 1-7	NO
Industrial applicability (IA)	Claims 1-7	YES
	Claims —	NO
Citations and explanations		

The following documents have been cited in the Search Report:

D1: WO 1999/018059 A1

D2: WO 2003/022791 A1

D3: US 5183933 A1

D4: US 4950786 A1

D5: JP 06 279356 A2

Document D1 describes a process for the oxidation of 2,6-dimethylnaphthalene to 2,6-naphthalenedicarboxylic acid using cobalt, manganese and bromine as catalysts and acetic acid as solvent. The same reaction temperature as claimed in claim 1 of the present application is already described in claim 4 and on page 5 of document D1. That means claims 1 and 2 of the present application lack novelty as well as inventive step.

In claims 2 and 3 of document D1 the same concentration of the metal catalysts in acetic acid is described as it is claimed in claim 3 of the present application. That means also claim 3 lacks novelty and inventive step.

The ratio of 1:0,5 of cobalt and manganese is already described in line 24 on page 4 of document D1. Moreover it is indicated in document D1 that for the purity of the desired product it would be advantageous to use more cobalt. The high amount of manganese was only used, because manganese is cheaper than cobalt. That means also claim 4 lacks novelty and inventive step.

The molar ratio of bromine to the metal catalysts as claimed in claim 5 of the present application is already described on page 4, lines 17-20 of document D1. That means also claim 5 lacks novelty and inventive step.

On page 6, lines 4 and 5 of document D1 the proposed reaction time is identical to the reaction time as claimed in claim 6 of the present application.

**WRITTEN OPINION**

International application No.  
PCT/KR 03/00883

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V (page 1)

The document D2 was published on 20 March 2003 (20.03.2003) and would loose its relevance if the applicant would submit a translation of the priority document. In claims 11 and 12 of document D2 the use of nitrogen for the regulation of the oxygen content in the reaction gases I already described. Since also in document D5 the utilization of nitrogen in combination with oxygen is proposed, claim 7 of the present application would not meet the criteria of inventive step.

The documents D3 and D4 were cited in the search report to illustrate that the parameters of the process claimed in the present application are already well known state of the art, even if each of the documents D3 and D4 do not contain all parameters as claimed in the present application.

That means: The claims 1-6 of the present application do not meet the criteria of novelty and all 7 claims of the present application do not meet the criteria of inventive step.

The attention of the applicant is drawn to the fact that claim 7 of the present application does not indicate very clearly what the scope of this claim is, maybe this is only a language problem.

Industrial applicability is given.